DOCUMENT RESUME

ED 033 105 TE 001 516

By-Skipper, Charles E.

A Study of the Development of Creative Abilities in Adolescence.

Pub Date [69]

Note-99p.

Available from-Project Director, Living Arts Program, 612 Linden Ave., Dayton, Ohio 45403 ($3.00)

EDRS Price MF-$0.50 HC Not Available from EDRS.

Descriptors-*Creative Ability, *Creative Development, *Creativity Research, *Cultural Enrichment, Fine Arts, Originality, Personality Development, Personality Studies, Student Ability, Talent Development, Talented Students, Teaching Methods

Identifiers-*Living Arts Program

The purpose of this study, sponsored by an ESEA title 3 grant, was to evaluate the effectiveness of the Living Arts Program in developing creative behavior in adolescents. The subjects consisted of an experimental group of 188 students in grades 7-10 who took part in the Living Arts Program for one semester and a similar group of students who did not. Each group was divided into high, middle, and low levels of creativity on the basis of scores on a "Things Done On Your Own Checklist." The data obtained from tests given to these students in October 1967 and January 1968 led to the following conclusions: (1) Females in the experimental group increased their aesthetic sensitivity and engaged in significantly more independent creative activities than did those in the control group. (2) Males and females in the experimental groups participated more actively in community cultural activities than did those in the control group, and increased significantly their creative thinking. (3) Students in the experimental group reported a positive self concept and believed themselves to have considerable imagination, curiosity, and creative personal qualities. The findings appeared to substantiate the theory that deliberate efforts to improve certain types of creative behavior can be successful. (MP)

ED0 33105

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A STUDY OF THE DEVELOPMENT OF CREATIVE ABILITIES IN ADOLESCENCE

TE 001 516

LIVING ARTS PROGRAM

TITLE III, E.S.E.A.

ACKNOWLEDGEMENT

Many people made important contributions to this study. Special thanks go to George Kohlerieser who collected data and scored the tests with dedication and accuracy. Art Fiser, Assistant Director of the Computer Center, Miami University, cheerfully gave of his time and talent in computing and interpreting data. To the principals of the Dayton Public, private, and parochial schools goes our appreciation for administrative arrangements for this study. Of course, we deeply appreciate the concern and understanding of the parents and children who are associated with the Living Arts Program.

Charles E. Skipper

FORWARD

LIVING ARTS PROGRAM

The Living Arts Program is an operational Project to Advance Creativity in Education (PACE) financed under Title III of the Elementary and Secondary Education Act of 1965.

The purposes of the Living Arts Program are to identify, nurture, and evaluate the creative potential of youngsters whose interests lie in the Fine Arts - Creative Writing, Dance, Drama, Music, and the Visual Arts.

Students, grades 6 - 11, selected as to their keen interest and creative potential, are participating in the Living Arts Program. The Living Arts Program will expand to include students 5 - 12 the summer of 1969.

Selected students have the opportunity to participate in the many facets of the Arts and to study in depth, one or more of the Arts through:

EXPLORATORY EXPERIENCES: Although a student selects one art area in which to concentrate, he is encouraged to explore and to experiment with the other art areas developing, hopefully, new interests, ideas, and skills.

LEARNING IN-DEPTH EXPERIENCES: Through the use of specialists as instructors, minimum class sizes, and superior facilities, students have the opportunity to develop their individual abilities and interests.

HUMANITIES ROUNDTABLE: Students have the opportunity to investigate and gain further knowledge of the ways and means man has devised to express himself through the arts and the interrelationships of the Arts.

GUEST ARTISTS: Professional artists in all five areas are engaged to work directly with students sharing their experiences and knowledge about their craft and profession. All students, K-12, in the Dayton schools share in performances, exhibitions, and lecture-demonstrations through individual school and classroom presentations by guest artists and by the Living Arts staff.

Teachers and administrators will have the opportunity to participate in a planned, sequential inservice training program through conferences, seminars, and workshops conducted by the Living Arts staff and guest artists.

Parents of selected students will have the opportunity to participate in a program to hear the Living Arts staff and guest artists discuss the arts and creativity, to share with each other problems and/or learn about new plans and activities in the Center.

The Living Arts Program functions after school hours and on Saturdays and is located at 612 Linden Avenue, Dayton, Ohio.

The Living Arts Program is a supplementary service and is designed to enhance not to supplant the educational opportunities inherent in the schools of Dayton.

The ultimate aim of the Living Arts Program is to make students aware of the world around them and to use this cognizance as a source for expressing themselves through the Arts.

Jack A. DeVelbiss, Project Director	Glenn Ray, Program Director

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CHAPTER 1

The Nature of Creative Abilities

Change is bewilderingly rapid in our present space age. The innovations and discoveries of the next decade will probably make previous progress look slight indeed. Therefore, a person cannot foresee exactly what knowledge he will need in meeting future problems. He can, however, develop the abilities and attitudes that will help him meet any future problem creatively. Of one thing we can be sure there will be less emphasis on memory and more on creative thinking.

Research on the development of creative behavior has been conducted on an increasing scale since J. P. Guilford, in 1950, emphasized the appalling neglect of the study of creativity (3). The first wave of research dealt with the identification of creative talent. The second wave, following the suggestion of Torrance, concerned experimentation with teaching procedures that hopefully will stimulate students to think independently, to test their ideas, and to communicate them to others.

According to Guilford, creativity is "something that lies behind behavior that is imaginative and inventive." (3) It is found in clearest form in some people: scientist, artist, writer; but it is shared by all. A person must arrive at a product that has novel aspects as far as he is concerned. Creative thinking abilities are found among the rest of the intellectual abilities, divergent thinking in particular. Three traits--flexibility, fluency and orginality--are most obvious in divergent thinking. (3) Guilford maintains that these three main components are necessary and sufficient for creativity when possessed in adequate amounts, assuming adequate motivating conditions.

E. Paul Torrance (17) discusses several definitions of creativity and chooses to define it as the process of sensing problems or gaps in information, forming ideas and hypotheses, testing and modifying these hypotheses, and communicating the results. This purpose may lead to any one of many kinds of products--verbal and nonverbal, concrete and abstract.

Creativity is sometimes contrasted to conformity and is defined as the contribution of original ideas, a different point of view, or a new way of looking at problems, whereas conformity is defined as doing what is expected without disturbing or causing trouble for others. Creativity has also been defined as a successful step into the unknown, getting away from the main track, breaking out of the mold, being open to experience and permitting one thing to lead to another, recombining ideas or seeing new relationships among ideas. Concepts such as originality, curiosity, imagination, discovery, innovation and invention are also prominent in discussions of creativity. (16)

For the purposes of their study, Getzels and Jackson (2) defined creativity as a "fairly specific type of cognitive ability reflected in performance on a series of paper and pencil tests involving the ability to deal inventively with verbal and numerical symbol systems and with object-space relations. Scores on these tests depended on the number, novelty and variety of adaptive responses to a given stimulus task. They assumed that these creative thinking abilities are found to some extent in all persons.

Donald MacKinnon (8) has suggested there are types of creativity. In the first of these, the product of the creation is clearly an expression of inner states, e.g. the needs, perceptions, evaluations, etc. of the creator. In this type of creativity, the creator externalizes something of himself into the public field. Examples of this kind of creativity would be found in the work of the expressionistic painter or sculptor, poet, novelist, playright, or composer.

In the second type of creativity, the creative product is unrelated to the creator as a person, who in his creative work, acts largely as a mediator between externally defined needs and goals. In this kind of creativity, the creator simply operates on some aspect of his environment in such a manner as to produce a novel or appropriate product, but he adds little of himself to the resultant. Examples of this kind of creativity would be found in the work of the research scientist, the engineer and

and mechanical inventor.

J. P. Guilford, writing about creative abilities in the arts (4), states that artistic talent is not a unitary or uniform commodity, but is rather a collection of different component abilities or other traits. It is expected that the creative abilities of artists will be found to involve some factors distinct from, yet parallel to, those among creative abilities in fields such as science and management. Factors thought to be important in the arts are found among the whole collection of intellectual abilities as mapped out in Guilford's structure of the intellect. The thinking factors can be classified in three groups on the basis of the kind of action performed on the content: cognition factors, production factors, and evaluation factors. Although a total creative act involves all three groups of factors, the production aspects are most conspicuous and most crucial. Among the production thinking abilities there is another distinction between convergent thinking, which leads to one right answer, and divergent thinking, which does not result in one right answer, but depends upon going off in different directions.

Among the divergent thinking abilities, some are recognized as being more creative than others--for example, fluency, flexibility and originality. Although they may contribute to reaching one right answer, they are most obvious in activities where that is not the case, such as in the arts, where some answers are merely regarded as better than others.

Four fluency factors have been identified. Two of them, word fluency and associational fluency have to do with the production of single words. In tests of word fluency the words produced must meet certain structural criteria such as listing words beginning with a certain letter. Associational fluency is measured by tests that involve listing words having some meaningful requirements, such as listing synonyms for a stimulus word. Ideational fluency is the ability to produce a succession of ideas meeting certain meaningful requirements, such as listing of things round or of titles for a story plot. Quantity, and not quality, is important. The fourth fluency factor, expressional fluency, is the ability to put ideas into words. This is measured by tests requiring the putting together of words in appropriate, connected discourse.

Guilford has found two flexibility factors. One, which is found in verbal tests, is called spontaneous flexibility because the subject shows flexibility on his own initiation; the test items do not require it. It is possible that this trait might serve as the basis for very fanciful, creative imagination whereever it is found, for example, in artists and scientists alike. The second flexibility factor, found mostly in nonverbal tests, is called adaptive flexibility because it is important in the solution of problems, particularly those that require striking out in new and unusual directions.

The one factor of originality is indicated by varied tests that require unusual or uncommon responses, remote associations or connections, or clever responses. Orginality may prove to be a temperamental or motivational variable, such as a general set to be unconventional or to avoid repeating what others have done.

In addition to factors of fluency, flexibility and originality, several other factors have been found to be related to creativity. The ability to see problems is a congnition factor rather than a production factor, and is confined to seeing defects and deficiencies in such practical matters as everyday gadgets and implements. The factor of redefinition involves the ability to desert one interpretation or conception of an object and to adapt it to new functions or uses. It is a divergent thinking factor that involves the production of a shift of meaning of an object. The factor of visualization is the ability to think of changes or transformations of a figural kind in visually perceived objects. The relation of such an ability to work in the visual arts can be readily imagined. There might even be a parallel factor in the auditory field, enabling a composer to produce variations on a theme.

A factor of evaluation ability was hypothesized, not as a contributor to the production of creative results, but as a means of determining whether such results are good, suitable, correct or adequate. Three general evaluation factors were found. Logical evaluation is the ability to judge products on the basis of their logical consistency with given facts. Experiential evaluation is the ability to judge products in terms of consistency with past experience. A third factor of uncertain generality is perceptual evaluation which is measured by tests that emphasize comparisons of lengths of lines and total sizes of figures. (It may therefore be related to the more limited length estimation factor that was previously known). As for evaluation in the arts, the logical evaluation factor would not apply. Experiential evaluation abilities might account for aesthetic tastes in terms of aesthetic values. Perceptual evaluation abilities would have much bearing on the acceptability of art forms, visual, auditory or kinesthetic.

Guilford maintains that in the creative activities of everyday life, primary mental abilities other than those regarded as primarily creative are also important. For example, a verbal comprehension factor would be important for a creative writer, and a spatial orientation factor would be important for a developer of ideas in descriptive geometry. A visual memory factor would be important for artists, and an auditory memory factor may play a similar role for the composer.

Minimal levels of these primary mental abilities related to creativity are desirable for success in various artistic activities. They are not only necessary, but when possessed in adequate amounts, are sufficient, assuming adequate motivating conditions. In the process of surveying the resources of creative artists of any kind, whether for the sake of better understanding of talent or for the practical purposes of prediction and guidance, it would be well to ask whether any of the intellectual factors may play a significant role.

CHAPTER II

Characteristics of the Creative Person

What are the characteristics of a creative person? Guilford and his associates (Guilford, Christensen, Frick and Merrifield, 1957) were interested in determining what relationships might exist between measures of temperament and motivation and measures of creative performance. They found that creativity appears to be related to impulsiveness, and inclination away from neuroticism. Those high in originality tend to be interested in aesthetic expression, in meditative or reflective thinking, and appear to be more tolerant of ambiguity and to feel less need for discipline and orderliness.

Taylor (13), writing on the motivational characteristics of creative persons, states that the creative person is curious, interprising in his ideas, intellectually persistent, tolerant of ambiguity; he shows initiative in his area of work; he likes to think and to manipulate ideas; he has an inner need for recognition; he needs variety and autonomy; he has a preference for complex order and for changes therein; he has an esthetic and to some extent religious orientation; he resists premature closure and crystallization of concepts, though he has a strong need for ultimate closure; he desires mastery of a problem; he finds challenging the intellectual ordering of the apparently unclassifiable; and he wants to improve upon currently accepted orders and systems. The use of passional sources of energy and kinesthetic cues may be important. High energy with vast work output through disciplined work habits is usually found. Other traits which have been suggested are a willingness to take greater and more long-range risks for greater gain and a tendency to accumulate an over-abundance of raw material for the task at hand coupled with a willingness to take greater and more long-range risks for greater gain and a tendency to accumulate an overabundance of raw materials for the task at hand coupled with a willingness to discard some of it in forming final products. Concerning personality characteristics, Taylor states that creative persons are more autonomous than others, more self-sufficient, more independent in judgment (they go against group opinion if they feel it is incorrect), more open to the irrational in themselves, more stable, more feminine in interests and characteristics (especially in awareness of their impulses), more dominant and self-assertive, more complex, more self-accepting, more resourceful and adventurous, more radical (Bohemian), more self-controlled, and possibly more emotionally sensitive, and more introverted, and bold. Creative people in different fields may have different personal characteristics. For example, in art, the spatial sense and visual imagery may play a special role.

Torrance, (15) after reviewing the research literature on the creative personality, concluded that creative individuals are less interested in small details and practical and concrete aspects of life, and are more concerned with meanings, implications and symbolic equivalents of things and ideas.

MacKinnon (9) studied the personal characteristics of creative architects and found that the more creative exhibit a sensitive awareness of self and others, and openness to their feelings and emotions, and wide-range interests, many of which are regarded as feminine in our culture. The highly creative have the ability to tolerate the tension that arises from apparent polar opposite needs and values. For example, creative architects value both theoretical and esthetic concepts. These values seem contradictory and are; but the creative person with his complex personality, searching for richness and diversity, can balance these different values in such a way that adds to his perception of life.

According to Torrance (16), a creative child may possess a need to know himself and his environment and to seek out new experiences and examine and explore stimuli. He is likely to exhibit orginality; imagination and experimentation; independent, individualistic, courageous and non-conforming behavior; unusual flexibility in meeting emergencies; unwillingness to give up; constructiveness; daydreaming; and preoccupation with an idea or problem. Further, Torrance (16) believes that the creative child is likely to be "one-sided" in development, to want to learn on his own, to attempt difficult tasks, to try to achieve uniqueness. As a result of his divergency, he is likely to feel isolated and psychologically estranged from parents, teachers, and peers.

Getzels and Jackson (2), in studying the creative adolescent, found their high creative group significantly superior to the school population in scholastic achievement, although it was below the mean in IQ of a highly intelligent group. Other characteristics of their high creative group were a sense of humor, playfulness, and the ability to produce new themes and to go off in new directions. They were not success oriented by conventional adult standards, and they placed highest value on qualities other than those necessary for success and teacher preference.

Wallach and Kogan (19) believe in order to list the characteristics of creative children it is necessary to know whether creativity is present in the context of high or low intelligence. In their study they found that children high in both creativity and intelligence showed the least doubt and hesitation and the highest level of self-confidence, and they displayed the least tendency toward depreciation of oneself and one's work. Concerning companionship, these children were sought out by their peers more often than any other group, and they also sought the companionship of others most actively. This group showed the highest levels of attention span, concentration, and interest in academic work. In these respects, according to Wallach and Kogan, these high creativity - high intelligence children reflected highly desirable modes of conduct. However, this group was also high with regard to disruptive, attention-seeking behavior. They may have been brimming over with eagerness to propose novel, divergent possibilities in the classroom, in the face of boredom with the customary classroom routines.

The high creative group with low intelligence may be at the greatest disadvantage in the classroom. This group was found to be the most cautious and hesitant, the least confident and self-assured, the lease sought after by their peers as companions and was quite avoidant of the companionship to others. These children were the most deprecatory of their own work and the least able to concentrate and maintain attention. In terms of disruptive attention-seeking, this group was high, like the high creativity - high intelligence group suggested enthusiasm and overeagerness, that of high creativity - low intelligence group suggested an incoherent protest against their plight.

Creative Process

Most writers agree on the descriptive of the creative process. Torrance (16), who reviewed the literature, found most writers agreeing on the following four steps: preparation, incubation, illumination, and revision. Torrance suggests a process flows something like the following. First, a sensing of a need of deficiency, random exploration and clarification of the problem. Then ensues a period of preparation accompanied by reading, discussing, exploring and formulating many possible solutions, then critically analyzing these solutions for advantages and disadvantages. Out of all this comes a new idea. Finally, there is experimentation to evaluate the most promising solution for eventual selection and perfection of the idea. Such an idea may become an invention, scientific theory, improved product of method, novel, musical composition, painting or new design.

CHAPTER III

Developing Creative Abilities

According to Torrance (17), the research evidence in favor of deliberate efforts to improve the quantity and quality thinking is impressive. Deliberate methods such as brainstroming, creative problem solving, synectics (creative problem solving based on the idea that creative efficiency will be increased if people understand the psychological processes by which they operate), and bionics (a similar method using analogies to biological and electrical phenomena as a source of generating new ideas) have proven successful.

Torrance offers several suggestions that teachers can use to provide the conditions conducive to create thinking. He suggests offering a curriculum with plenty of opportunities for creative behavior; developing the skills of inquiry, creative research and creative problem solving which are not required in learning by authority, rewarding creative expression through the kinds of behaviors we encourage and by the way we respond to curiosity needs; and providing for continuity of creative development. He encourages the teacher to work hard to develop a creative relationship with his pupils. This requires a willingness on his part "to let one thing lead to another, to embark with the child on an unknown adventure," and a friendly environment and mutual understanding and respect for the dignity and worth of the individual.

Torrance also cites the extensive work of Ligon, who attempted to establish age-level characteristics for the development of the imagination of vision from birth to age 16. He also developed lists of methods for guiding this and other dimensions of growth. For children from birth to age 6, he recommends encouraging the child to explore, providing flexible toys, encouraging independence and discovery and patiently answering questions. In the elementary years it is important to encourage role playing in adult activities, to provide many opportunities for the expression of originality and ingenuity, to provide experience in planning and carrying out ideas, and to display creative products. In the high school years, it is important to help the student make decisions, to challenge him to exciting but difficult projects, to teach learning skills and creative problem solving and to provide food for thought.

Myers and Torrance (12) offer the following five principles for rewarding creative thinking children:

1. Treat questions with respect.
2. Treat imaginative ideas with respect.
3. Show your pupils that their ideas have value.
4. Occasionally have pupils do something "for practice" without the threat of evaluation.
5. Tie in evaluation with causes and consequences.

In this study the authors asked teachers to report their experiences in attempting to apply the five principles to teacher-learner situations. They found at least ten characteristics present among the teachers who could not apply one or more of the accepting, supporting principles. Collectively, they were authoritarian, defensive, dominated by time, insensitive to pupils' intellectual and emotional needs, lacking in energy, preoccupied with their information--giving functions, intellectually inert, disinterested in promoting initiative and self-reliance in their pupils, preoccupied with disciplinary matters, and unwilling to give much of themselves in the teaching-learning compact. The authors conclude that values are a major concern in understanding human behavior, and that it is time to begin understanding the main forces in the teacher's life and allow for the expression of creative abilities in themselves and their students.

Klausmeier (6) offers the five following principles, applicable to all age levels, for encouraging creativity; encourage creativity in many media; foster divergent production; foster a creative personality; encourage continuing creative expression; and encourage productivity. He emphasizes the importance of the teacher in encouraging original expression. One of the most effective means that can be used is rewarding creative behavior when it occurs. Merely letting the student present original ideas and attempting to understand his reasoning are often enough. Displaying creative behavior himself will also encourage creativity in his pupils. To make the creative student feel comfortable in the school setting, the teacher can encourage a wide range of approved behavior patterns in the classroom.

George I. Brown (1) illustrated in a controlled study that creative sub-selves and non-creative sub-selves developed and crystallized around specific symbols could be triggered by invoking the specific symbol. A comparison of mean scores between tests of creative abilities given under conventional and triggered conditions revealed significant differences at the .001 level. The creative sub-self scored showed a high preference for complexity, and the non-creative sub-self scored showed a preference for simplicity on the Barron-Welsh Art Scale.

Maltzman (11) reviewed the experimental research that is relevant to the problem of devising techniques for increasing originality. He quotes Mearns' work which emphasized that to facilitate the originality of school children in the arts, the teacher must reinforce, and manifestly approve the student's original efforts. The teacher is advised to approve of only the genuinely original effort, and to wait patiently for the appearance of original behavior which is fostered by a "permissive atmosphere", the absence of "drill" and excessive discipline. According to Mearns, original behavior appears eventually because all normal children have an urge, energy, or impulse to be creative. Maltzman suggests that the early psychological literature tended to agree upon a small number of different procedures for increasing originality. One trailing procedure was to present an uncommon stimulus situation, a situation for which common or conventional responses may not be readily available. Relatively uncommon responses may be evoked as a consequence. Another procedure is the evocation of different responses to the same stimulus situation. Under such conditions the successive responses may become more uncommon. A third training procedure is the evocation of uncommon responses as textual responses.

According to Maltzman, the fundamental problem in the training of originality is to devise a means of increasing the frequency of uncommon behavior. Once it occurs, reinforcement may take place, thus increasing the probability that other original behavior will occur. He described a procedure used in experiments by himself and his associates which consistently facilitated originality. This procedure involves the repeated presentation of a list of stimulus words in a modified free association situation accompanied by instructions to give a different response to each stimulus. Under these conditions the responses became more uncommon. When presented with new stimulus materials, subjects receiving such training are reliably more original than subjects receiving no training.

Torrance (18) reports a study which examined the effects of a training session using a set of questions or principles for stimulating new ideas and the effects of motivation toward quantity or quality or ideas on the creative behavior of elementary pupils. The results showed that pupils in the primary grades, with the possible exception of the first, can in a short period be taught a set of principles that will enable them to produce more and better ideas than they would without training. The results provide no support for motivating pupils to produce a quantity of ideas without considering quality.

Wallach and Kogan (19) have emphasized the importance of freedom from the pressure of time limits. They stress the lessening of valuational presures, and the maintainance of a state of "letting things happen" in encouraging creativity. On the basis of their ability to create a game-like, permissive atmosphere within a segment of the school day by bringing in individuals who were disassociated from the standard intellective-achievement value matrix, they have proposed a creativity training program in which a scholl system would provide personnel who would travel from one class to another for the purpose of "playing games" ("games" being the kinds of creativity procedures used in their study). These tasks should be perceived by the children as games which, not unlike music and art instruction which is provided by special personnel--are outside of the academic-evaluation setting. Wallach and Kogan believe that only the most capable of regular classroom teachers would be able to establish the necessary non-evaluational atmosphere, given their strong association in the children's eyes with success and failure evaluation, and given their own committments to the more traditional parts of the curriculum. The success of such a training program depends upon the transfer affects from special training to the academic subject matter areas. In addition, Wallach and Kogan recommend that teachers be taught to de-emphasize the success-failure aspects of the learning process and to encourage children to approach school assignments in a spirit of associative play, and that education proceed in part by "inductive teaching" or the "discovery method", both of which require the child to go through the steps by which a particular piece of knowledge was achieved and create the situations in which intelligent questions are likely to be asked. The "discovery method" involves associative modes of thinking in the child and, therefore, is of relevance for both creativity and intelligence.

Parnes and Meadow (13) found that a creative problem-solving course in which the brainstorming principle was emphasized produced a significant increase in productivity on five of seven tests of creative ability. Further they found that increased productivity in creative thinking produced by a one-semester Creative Problem Solving course persisted for a period of eight months or more after the termination of the course.

CHAPTER IV

Methodology

In the Fall of 1967, 3,009 students in grades 7, 8, 9 and 10 in the Dayton Public and Parochial Schools expressed their interest in participating in the Living Arts Program. From this group 332 were chosen to participate in the first year of the program. From this group of 332, 188 were selected as an experimental group and were divided into three groups: 62. high, 62 Middle, and 64 Low Creative, based on scores from the Things Done On Your Own Checklist. From the 2,677 students not chosen to participate in the program, a control group of 188 matched for sex, grade level, school and creative level were selected.

The mean score for the 3,009 students on the Things Done On Your Own Checklist was 36.22 and the standard deviation was 15.67. Students assigned to the high creative level had a score one standard deviation above the mean; low creative level students had a score on standard deviation below the mean and middle level creative students had scores at the mean. A copy of Things Done On Your Own Checklist is found in the appendix. Students were also rated by three different teachers on the Student Creative Rating Scale, a 22 item bi-polar scale of personal characteristics that are related to creative behavior. Because of low inter-rater reliability, these scores were not used in the selection process.

As would be expected in a longitudinal study, there would be some attrition of students in the sample. Shown below in table form are the number of students dropping out of the experimental group.

Attrition rate for Female Experimental Group.

Creative Level	Fall 1967	Winter 1969	Dropouts
	N	N	N
High	46	21	25
Middle	46	23	23
Low	45	16	29

For the female high creative group, 10 dropped out because of too many activities; 6 lost interest in the program; 5 moved from Dayton; 2 dropped out and gave no reason; 1 had transportation difficulties and 1 was dropped because of poor attendance.

For the middle level female 11 moved from Dayton; 7 felt they had to many other activities; 2 dropped because of poor transportation facilities; 1 dropped because of sickness in the family; 1 for lack of interest and 1 did not re-enter this second year and gave no reason.

For the low creative female group 13 moved from Dayton; 8 had too many other activities; 7 no longer were interested in the program and 1 had difficulty with transportation.

In table form are the sample size for the male experimental group for the second year period.

Attrition Rate for Experimental Group Male.

Creative Level	Fall 1967	Winter 1969	Dropouts
	N	N	N
High	16	12	4
Middle	16	7	9
Low	19	7	12

For the high creative male group, 2 moved from Dayton, 1 had too many activities, and 1 lost interest in the program.

For the middle level group, 4 moved from Dayton; 3 had too many other activities and 2 lost interest.

In the low creative level, 2 moved from Dayton; 3 were dismissed because of poor attendance, and 2 had other activities.

Listed below in table form are the results of dropout rate in both male and female control groups.

Attrition rate for female control group.

Creative Level	Fall 1967	Winter 1969	Dropouts
[illegible]	N	N	N
High	46	29	17
Middle	46	33	13
Low	45	35	10

Attrition Rate for Male Control Group.

Creative Level	Fall 1967	Winter 1969	Dropouts
	N	N	N
High	16	10	6
Middle	16	6	10
Low	19	13	6

Of the total of 62 dropouts from the control group; 49 moved from Dayton; 8 were sick during the testing sessions; 3 were not allowed to take the tests by order of their parents; and 2 could not be located at the time of testing.

With the groups identified, the following instruments were administered during the period of October, 1967, to January, 1968, as pre-tests to establish baseline scores to compare the extent of gain during participation in the program.

The Student Checklist of Creative Involvement with Community Activities yields four different scores: places visited, performances attended, participation in activities, and a total score. The total number of items to be checked is 63 with spaces for students to add responses. Performances on this scale is an index of involvement in the larger community both in terms of participation and attendance. A copy of this scale is in the appendix.

Three tests of creative thinking were given as pre-tests and the alternate form was given as a post test. The tests measured ideational fluency, sensitivity to problems and originality. Copies of these tests are found in the Appendix. The test used to measure ideational fluency was the _Things Categories Test_ designed by Cattell. Students were asked to write down things that are almost red or that red more often than any other color. The post-test asks for things that are always blue or that are blue more often than any other color. The task require a facility to call up ideas wherein quantity and not quality of ideas is emphasized. Quality enters the picture only as it must be satisfactory to the subject as he interprets the task to be performed. Since few subjects are able to produce ideas fast enough to write continually, actual motor speed in manipulating a pencil is not important. Since quality of ideas of language is not counted, variance of verbal skills is minimized.

The creative ability of originality was measured by J. P. Guilford's _Plot Titles Test_ which requires subjects to read the plot story then to write as many appropriate titles as possible. Some of the kinds of responses that are related to originality are common or clever comments which usually focuses on the essence of the plot; comments that are uncommonly stated or stated with neat brevity, and responses that structure the information given in the plot. Responses judged lacking in originality tended to be a mere cognition of the plot, vague and too general or confined to isolated aspects of the plot.

The dimension of sensitivity to problems, was measured by the Apparatus Test devised by J. P. Guilford. This test requires the subject to recognize practical problems and to offer improvements. Scoring considers improvements suggesting a major revision in the structure, use, or operation of the given object or minor imporvements. Unacceptable responses are judged as too vague, absurd or lead to an effect opposite to that intended by the given object.

In December 1968 and January 1969 the Things Done On Your Own Checklist and the Student Checklist of Creative Involvement in Community Activities were administered along with alternate forms of the creative thinking tests.

The two following scales were also administed to both the experimental and control groups in January 1969 after the Living Arts Program had been in operation for a year and a half. Both scales call for the subject to render a self report, based on his perception of himself. The Student Creativity Rating Scale, a 22 bi-polar item scale measuring personal characteristic that are related to creative behavior. Examples of the bi-polar items are Flexible - Rigid, Independence of judgement - Conformity, Curious - Unquestioning, and Sensitive to ideas - Insensitive to ideas. The 22nd item called for the subjects to rate themselves on the dimension of Creative - Noncreative. A copy of this scale is in the appendix. Both groups also took the Barron-Welsh Art Scale as a measure of the esthetic factor in creativity. Research by Barron has shown that artistic preference is related positively to rapid personal tempo, verbal fluency, impulsiveness and expansiveness. It is related negatively to rigidity and control of impulse by repression. Further, artistic preference is related positively to independence of judgement, originality, and breadth of interest.

General Hypothesis

Scores on all measures of creativity will increase significantly, relative to the pre-test performance, for students participating in the Living Arts Program, hereafter called the experimental group, as conpared to the control group not participating in the program. Both groups will be classified into high, middle, and low creative, with the data analyzed according to these categories and by sex.

Specific Hypothesis

1. Difference scores on the Things Done On Your Own Checklist, will significantly increase for the experimental group when compared to the difference scores of the control group.

2. Difference scores on the Places Visited scale of the Student Checklist of Creative Involvement with Community Activities, hereafter called the SCCICA will significantly increase

for the experimental group when compared to the difference scores of the control group.

3. Difference scores on the Performances Attended scale of the SCCICA will significantly increase for the experimental group when compared to the difference score of the control group.

4. Difference scores on the Activities scale of the SCCICA will significantly increase for the experimental group when compared to the difference scores of the control group.

5. Difference scores on the SCCICA Total will significantly increase for the experimental group as compared to the difference scores of the control group.

6. Difference scores on the Things Categories Test, a measure of ideational fluency, will significantly increase for the experimental group as compared to the differance scores of the control group.

7. Difference scores on the Plot Titles Test, a measure of originality, will significantly increase for the experimental group when compared to the difference scores of the control group.

8. Difference scores on the Apparatus Test, a measure of sensitivity to problems, will significantly increase for the experimental group when compared to the difference scores of the control group.

The following hypotheses were tested by comparing experimental and control groups perceptions of themselves and their artistic preferences one and one-half years after the beginning of the Living Arts Program and experiment. The data was analyzed using high, middle and low creative categories and male and female groups.

9. Scores on the Student Creative Rating Scale for the experimental group will be significantly higher when compared to the control group.

10. Scores on the "creative" item of the Student Creative Rating Scale will be significantly higher for the experimental group when compared to the control group.

11. Scores on the Barron-Welsh Art Scale will be significantly higher for the experimental group when compared to the control group.

After comparisons have been made between experimental and control groups, the data will be analyzed comparing each of the high, middle and low creative experimental group with the high, middle and low creative control group. The purpose of this analysis will be to determine which level of creativity, if any, is showing significant increases. The following variable will be analyzed using "difference" scores:

a. Places Visited Scale of the SCCICA.

b. Performances Attended scale of the SCCICA.

c. Activities scale of the SCCICA.

d. Total score of the SCCICA.

e. Things Categories Test

f. Plot Title Test

g. Apparatus Test

The following data will be analyzed by comparing single scores:

a. Student Creative Rating Scale

b. Creative Item

c. Barron-Welsh Art Scale

STATISTICAL ANALYSIS

A two by three design, using two treatment groups, one experimental and one control, and three subject groups, high middle and low creative were used. The results will be analyzed by the analysis of variance method, using levels of .05 and .01 to determine significant differences. Comparisons between levels of groups were made by using the Mann-Whitney U Test with .05 and .01 as levels of significance.

CHAPTER V

Results of the Investigation

The data from this investigation was analyzed by comparing high, middle, and low creative experimental groups, with a high, middle and low creative control group. The first eight hypothesis were tested by comparing "difference" scores between pre-test and post-test scores. In this procedure the pre-test score establishes a "baseline" from which growth is compared. The post-test, either the same test or an alternate form of the pre-test, is a measure of development since students began participating in the Living Arts Program. The "difference" score is the result of subtracting the pre-test score from the post-test score.

The first hypothesis stated that "difference" scores on the Things Done On Your Own Checklist will significantly increase for the experimental group when compared to the difference scores of the control group. Tables 1 and 2 present the data supporting the hypothesis for the female but not the male. For the female group, the differences are significant at the .05 level of confidence. From this we infer that participation in the educational and cultural experience of the Living Arts Center encouraged the females to engage in more creative activities of an independent nature.

TABLE 1

Differences between pre-test and post-test scores for experimental and control females on the Things Done On Your Own Checklist.

SOURCE	df	SS	MS	F
Between	1	862.36	862.36	4.96*
Within	151	26276.89	174.02	

*P=.05

TABLE 2

Differences between pre-test and post-test scores for experimental and control males on the Things Done On Your Own Checklist.

SOURCE	df	SS	MS	F
Between	1	438.31	438.35	1.57
Within	54	15077.12	279.21	

The second hypothesis stated "difference" scores on the Places Visited scales of the SCCICA will significantly increase for the experimental group as compared to the "difference" scores of the control group. This hypothesis is accepted for both male and female experimental groups, the differences are significant at the .01 level. Tables 3 and 4 present this data.

TABLE 3

Differences between pre-test and post-test scores for experimental and control females on the SCCICA Places Visited Scale.

SOURCE	df	SS	MS	F
Between	1	101.49	101.49	17.03**
Within	151	899.81	5.96	

**P=.01

TABLE 4

Differences between pre-test and post-test scores for experimental and control males on the SCCICA - Places Visited Scale.

SOURCE	df	SS	MS	F
Between	1	41.32	41.32	7.19**
Within	54	310.26	5.74	

**P=.01

The third hypothesis stated "difference" scores on the Performances Attended scale of the SCCICA will significantly increase for the experimental group as compared to the difference scores of the control group. Tables 5 and 6 indicate that this hypothesis is accepted for both males and females, with the differences between experimental and control groups significant at the .01 level.

TABLE 5

Differences between pre-test and post-test scores for experimental and control females on the SCCICA Performances Attended Scale.

SOURCE	df	SS	MS	F
Between	1	76.37	76.37	7.22**
Within	151	1597.06	10.58	

**P=.01

TABLE 6

Differences between pre-test and post-test scores for experimental and control males on the SCCICA Performances Attended Scale

SOURCE	df	SS	MS	F
Between	1	493.60	493.60	20.02**
Within	54	1331.22	24.65	

**P=.01

The fourth hypothesis stated that difference scores on the Activities scale of the SCCICA will significantly increase for the experimental group as compared to the difference scores of the control group. The data in tables 7 and 8 show that this hypothesis is accepted with both male and female experimental groups participating in a greater number of cultural activities than the control group. Differences between experimental and control groups are significant at the .01 level, which indicates these differences could have occured only one time in one hundred due to chance.

TABLE 7

Differences between pre-test and post-test scores for experimental and control females on the SCCICA Activities Participated Scale.

SOURCE	df	SS	MS	F
Between	1	190.09	190.09	17.82**
Within	151	1611.05	10.67	

**P=.01

TABLE 8

Differences between pre-test and post-test scores for experimental and control males on the SCCICA Activities Participated Scale.

SOURCE	df	SS	MS	F
Between	1	273.62	273.62	13.97**
Within	54	1057.42	19.58	

**P=.01

Hypothesis number five stated that difference scores on the SCCICA total for the experimental group will significantly increase as compared to the difference scores of the control group. Data shown in tables 9 and 10 indicates that the hypothesis is true with the differences between experimental and control groups, both males and females, are significant at the .01 level of significance. From this data we can infer that experience in the Living Arts Program influenced the experimental group to receive a greater amount of cultural enrichment from community activities.

TABLE 9

Difference between pre-test and post-test scores for experimental and control females on the SCCICA Total Score.

SOURCE	df	SS	MS	F
Between	1	1069.57	1069.57	23.35**
Within	151	6370.17	42.19	

**P=.01

TABLE 10

Differences between pre-test and post-test scores for experimental and control males on the SCCICA Total Score

SOURCE	df	SS	MS	F
Between	1	2041.84	2041.84	24.92**
Within	54	4424.91	81.94	

**P=.01

Hypothesis number six stated that difference scores on the Things Categories Test, a measure of ideational fluency, will significantly increase for the experimental group as compared to the dffference scores of the control group. Tables 11 and 12 present the data for this hypothesis, which is supported only for the females. The F rate of 4.11 is significant at the .05 level. From this data it can be inferred that females participating in the Living Arts Program significantly increased their ability to produce many more ideas than the control group. The data did not support an increase in ideational fluency for males.

TABLE 11

Differences between pre-test and post-test scores for experimental and control females on the category test.

SOURCE	df	SS	MS	F
Between	1	65.14	65.14	4.11*
Within	151	2395.43	15.86	

*P=.05

TABLE 12

Differences between pre-test and post-test scores for experimental and control males on the Category Test.

SOURCE	df	SS	MS	F
Between	1	64.22	64.22	2.78
Within	54	1245.76	23.07	

Hypothesis number seven stated that difference scores on the Plot Titles Test, a measure of originality, will significantly increase for the experimental group as compared to the difference scores of the control group. Tables 13 and 14 present the data for male and female groups and show that the hypothesis is not supported.

TABLE 13

Differences between pre-test and post-test scores for experimental and control females on the Plot Test.

SOURCE	df	SS	MS	F
Between	1	0.08	0.08	0.02
Within	151	541.54	3.59	

TABLE 14

Differences between pre-test and post-test scores for experimental and control males on the Plot Test.

SOURCE	df	SS	MS	F
Between	1	.92	.92	.20
Within	54	250.25	4.63	

Hypothesis number eight stated that difference scores on the Apparatus Test, a measure of sensitivity to problems, will significantly increase for the experimental group as compared to the difference scores of the control group. The data indicates that only the males show differences that are significant at the .05 level of confidence. This data suggests that males participating in the Living Arts Program have developed a greater sensitivity to problems and are able to generate greater improvements for common household objects. The hypothesis cannot be supported for the females. Tables 15 and 16 present this data.

TABLE 15

Differences between pre-test and post-test scores for experimental and control females on the Apparatus Test.

SOURCE	df	SS	MS	F
Between	1	0.13	0.13	.01
Within	151	2975.22	19.70	

TABLE 16

Differences between pre-test and post-test scores for experimental and control males on the Apparatus Test.

SOURCE	df	SS	MS	F
Between	1	99.21	99.21	5.19*
Within	54	1032.40	19.12	

*P=.05

The following hypothesis were tested by comparing experimental and control high, middle and low creative students, according to sex, after the Living Arts Program and experiment had been in operation for a year and a half.

Hypothesis number nine stated that scores on the Student Creative Rating Scale for the experimental group will be higher when compared to the control group. This hypothesis is accepted for both male and female groups with the differences significant at the .01 level of significance. Tables 17 and 18 present this data. We can infer that students participating in the Living Arts Program perceive and describe themselves as having more creative characteristics than the control groups.

TABLE 17

Post-test score differences between experimental and control females on the Student Creative Rating Scale.

SOURCE	df	SS	MS	F
Between	1	2132.61	2132.61	11.02**
Within	151	29231.00	193.58	

**P=.01

TABLE 18

Post-test score differences between experimental and control males on the Student Creative Rating Scale.

SOURCE	df	SS	MS	F
Between	1	2032.37	2032.73	8.40**
Within	54	13072.75	242.09	

**P=.01

Hypothesis number ten stated that the experimental group will score significantly higher on the "creative" item of the Student Rating Scale when compared to the control group. Both male and female experimental groups have higher scores than the control groups. The differences are statistically significant at the .05 level. Tables 19 and 20 present this data. On the single dimension of "creative" both male and female experimental groups perceive and report themselves as being more "creative" than the control group.

TABLE 19

Post-test score differences between experimental and control females on "creative" item of the Student Creative Rating Scale.

SOURCE	df	SS	MS	F
Between	1	8.20	8.20	6.11*
Within	151	202.64	1.34	

*P=.05

TABLE 20

Post-test score differences between experimental and control males on "creative" item of the Student Creative Rating Scale.

SOURCE	df	SS	MS	F
Between	1	8.72	8.72	4.60*
Within	54	102.46	1.90	

*P=.05

Hypothesis number eleven stated that scores on the Barron-Welsh Art Scale will be higher for the experimental group when compared to the control group. The data in tables 21 and 22 show that the hypothesis is accepted only for the female group where the difference between experimental and control groups are significant at the .05 level. This data leads to the inference that experimental females are more aesthetically sensitive than are the female control group. No significant differences were observed for the male groups.

TABLE 21

Post-test score differences between experimental and control females on the Barron-Welsh Art Scale.

SOURCE	df	SS	MS	F
Between	1	547.03	547.03	5.40*
Within	151	15286.38	101.23	

*P=.05

TABLE 22

Post-test score differences between experimental and control males on the Barron-Welsh Art Scale.

SOURCE	df	SS	MS	F
Between	1	49.71	49.71	.35
Within	54	7586.69	140.49	

TABLE 23

Satistically significant differences based on "difference" scores between experimental and control groups, male and female on dependent variables at the .05 level and beyond.

GROUPS	DEPENDENT VARIABLES
Female	Things Done on Your Own Checklist
Female, Male	Places Visited Scale
Female, Male	Performances attended Scale
Female, Male	Activities Participation Scale
Female, Male	SCCICA Total Score
Female	Ideational Fluency -Category Test
	Originality - Plot Test
Male	Sensitivity to Problems Apparatus Test
Female, Male	Student Creative Rating Scale
Female, Male	Creative Item
Female	Barron-Welsh Art Scale

Table 23 shows all the significantly different variables when comparisons were made between experimental and control groups.

Tables in this section present the results of comparions by sex between high experimental and high control, middle experimental and middle control, low experimental and low control.

The data in tables 24, 25 and 26 show that the high, middle and low levels of creativity for both experimental and control groups, as determined by scores on the Things Done On Your Own Checklist, are significantly different from each other. Showing that the three levels are significantly different from each other on this variable is critical to the analysis of data where the various levels are compared.

TABLE 24

Differences between high and middle creative levels with respect to pre-test - Things Done On Your Own Checklist.

	High Level Creative			Mixed Level Creative			
Groups	N	M	SD	N	M	SD	T
Female Experimental	21	59.20	5.74	23	36.5	1.80	17.63**
Female Control	29	59.80	4.94	33	37.6	3.23	20.84**
Male Experimental	12	69.10	13.26	7	37.0	2.38	5.99**
Male Control	10	65.6	10.06	6	35.5	2.25	6.74**

**Significant at .01 level or beyond.

TABLE 25

Differences between high and low creative levels with respect to pre-test - Things Done On Your Own Checklist.

High Level Creative				Low Level Creative			
Groups							
	N	M	SD	N	M	SD	T
Female Experimental	21	59.20	5.74	16	21.7	3.02	23.10**
Female Control	29	59.80	4.94	35	23.1	4.39	30.96**
Male Experimental	12	69.10	13.26	12	23.2	4.87	10.77**
Male Control	10	65.60	10.06	13	21.8	3.36	13.99**

**Significant at .01 level or beyond.

TABLE 26

Differences between middle and low creative levels with respect to pre-test - Things Done On Your Own Checklist.

Middle Level Creative				Low Level Creative			
Groups							
	N	M	SD	N	M	SD	T
Female Experimental	23	36.5	1.80	16	21.7	3.02	18.56**
Female Control	33	37.6	3.23	35	23.1	4.39	15.21**
Male Experimental	7	37.0	2.38	12	23.2	4.87	6.65**
Male Control	6	35.5	2.25	13	21.8	3.36	8.55**

**Significant at .01 level or beyond.

TABLE 27

Differences between experimental and control female high, middle and low levels on the Things Done On Your Own Checklist.

Experimental Levels	N	Control Levels	N	U	P
High	21	High	29	1.98	.05
Middle	23	Middle	33	.52	n.s.
Low	16	Low	35	1.87	.06

The data in table 27 shows that the female experimental high creative level significantly increased their score on the Things Done On Your Own Checklist when compared to the High Control Group. This difference is significant at the .05 level. Neither the middle or low groups show significant differences although the low group difference is significant at the .06 level.

TABLE 28

Differences between experimental and control male high middle and low levels on the Things Done On Your Own Checklist.

Experimental Levels	N	Control Levels	N	U	P
High	12	High	10	45.50	n.s.
Middle	7	Middle	6	12.50	n.s.
Low	12	Low	13	77.50	n.s.

The results of comparisons between the three levels of creativity for the male experimental and control groups is shown in table 28. No statistically significant differences were obtained using the Things Done On Your Own Checklist.

TABLE 29

Differences between experimental and control female high middle and low creative levels on the SCCICA - Places Visited Scale.

Experimental Levels	N	Control Levels	N	U	P
High	21	High	29	1.72	.08
Middle	23	Middle	33	2.28	.05
Low	16	Low	35	2.59	.01

Both the low and middle creative experimental females show significant increases in the number of places visited when compared to the low and middle control group. The high experimental group's gain approaches significant at the .08 level. Table 29 presents this data.

TABLE 30

Differences between experimental and control male high, middle and low levels on the SCCICA - Places Visited Scale.

Experimental Levels	N	Control Levels	N	U	P
High	12	High	10	52.50	n.s.
Middle	7	Middle	6	3.50	.01
Low	12	Low	13	43.50	n.s.

The data in table 30 shows that the middle level creative male experimental group increased significantly in the number of places visited in the community. This difference is significant at the .01 level. No differences were observed for the high and low levels.

TABLE 31

Differences between experimental and control female high, middle and low levels on the SCCICA - Performances Attended Scale.

Experimental Levels	N	Control Levels	N	U	P
High	21	High	29	2.36	.05
Middle	23	Middle	33	.27	n.s.
Low	16	Low	35	1.57	n.s.

Table 31 presents the data on performances attended. Only the high creative experimental female shows a significant increase, which is equal to the .05 level. No significant differences were observed for the middle and low group females.

TABLE 32

Differences between experimental and control male high, middle, and low levels on the SCCICA - Performances Attended Scale.

Experimental Levels	N	Control Levels	N	U	P
High	12	High	10	26.00	.05
Middle	7	Middle	6	5.50	.05
Low	12	Low	13	33.50	.05

All three levels of the experimental male levels showed statistically significant increases in the number of performances attended when compared to the control groups. These differences are significant at the .05 level. Table 32 presents this data.

TABLE 33

Differences between experimental and control female high, middle, and low levels on the SCCICA - Activities Participated Scale.

Experimental Levels	N	Control Levels	N	U	P
High	21	High	29	2.98	.01
Middle	23	Middle	33	1.50	n.s.
Low	16	Low	35	2.19	.05

Both the experimental high and low creative female levels show significant increases in the number of community cultural activities of participants when compared to the high and low control levels. No significant increases was observed for the middle levels. Table 33 presents this data.

TABLE 34

Differences between experimental and control male high, middle and low levels on the SCCICA - Activities Participated Scale.

Experimental Levels	N	Control Levels	N	U	P
High	12	High	10	40.50	n.s.
Middle	7	Middle	6	9.50	n.s.
Low	12	Low	13	30.50	.01

Only the low level creative males show a significant increase in the number of cultural activities that require participation. This difference is significant at the .01 level. No differences were observed for the high and middle levels. Table 34 presents this data.

TABLE 35

Differences between experimental and control female high, middle, and low levels on the SCCICA - Total Score.

Experimental Levels	N	Control Levels	N	U	P
High	21	High	29	3.54	.01
Middle	23	Middle	33	1.68	.09
Low	16	Low	35	3.01	.01

Both the high and low levels in the experimental female group show significant increases on the total scores of the SCCICA. These differences are significant at the .01 level. No significant increases was observed for the middle level. Table 35 presents this data.

TABLE 36

Differences between experimental and control male high, middle and low levels on the SCCICA - Total Score.

Experimental Levels	N	Control Levels	N	U	P
High	12	High	10	27.50	.05
Middle	7	Middle	6	3.00	.01
Low	12	Low	13	26.50	.01

All three levels of male experimental group show significant increases on the total score of the SCCICA when compared to the control group. Table 36 presents this data.

TABLE 37

Differences between experimental and control female high, middle and low levels on the Category Test.

Experimental Levels	N	Control Levels	N	U	P
High	21	High	29	2.36	.05
Middle	23	Middle	33	.36	n.s.
Low	16	Low	35	.18	n.s.

For the females, only the high experimental creative level show significant increases on the ideational fluence dimension of creative thinking. This difference is significant at the .05 level. No significant differences were observed for the middle and low groups. Table 37 presents this data.

TABLE 38

Differences between experimental and control male high, middle and low levels on the - Category Test.

Experimental Levels	N	Control Levels	N	U	P
High	12	High	10	42.50	n.s.
Middle	7	Middle	6	7.00	.05
Low	12	Low	13	75.00	n.s.

Table 38 shows that for the males only the middle level experimental group showed a significant increase on the category tests, a measure of ideational fluency. This difference is significant at the .05 level. No differences were observed for the high and low level creatives.

TABLE 39

Differences between experimental and control female high, middle and low levels on the - Plot Test.

Experimental Levels	N	Control Levels	N	U	P
High	21	High	29	1.11	n.s.
Middle	23	Middle	33	.49	n.s.
Low	16	Low	35	1.98	.05

For the females, only the low creative show a significant increase over the control group, low creatives on the creative dimension of originality. Table 39 presents this data.

TABLE 40

Differences between experimental and control male high, middle and low levels on the Plot Test.

Experimental Levels	N	Control Levels	N	U	P
High	12	High	10	57.00	n.s.
Middle	7	Middle	6	18.50	n.s.
Low	12	Low	13	74.00	n.s.

For the males no statistically significant differences were obtained when comparing the high, middle and low levels with the control group for the creative dimension of originality. Table 40 presents this data.

TABLE 41

Differences between experimental and control female high, middle and low levels on the Apparatus Test.

Experimental Levels	N	Control Levels	N	U	P
High	21	High	29	1.81	.07
Middle	23	Middle	33	.69	n.s.
Low	16	Low	35	.38	n.s.

The data in table 41 shows that there was no significant gain for any female group on the apparatus test, a measure of sensitivity to problems. Only the high level increase approximates a significant difference which is significant at the .07 level.

TABLE 42

Differences between experimental and control male high, middle and low levels on the - Apparatus Test.

Experimental Levels	N	Control Levels	N	U	P
High	13	High	10	55.00	n.s.
Middle	7	Middle	6	15.50	n.s.
Low	12	Low	13	40.00	.05

The low level creatives of the male experimental group showed a significant increase on the apparatus test, a measure of sensitivity to problems. No differences were observed for the high and middle levels. Table 42 presents this data.

TABLE 43

Differences between experimental and control female high, middle and low levels on the - Student Creative Rating Scale.

Experimental Levels	N	Control Levels	N	U	P
High	21	High	29	1.16	n.s.
Middle	23	Middle	33	.32	n.s.
Low	16	Low	35	3.53	.01

The results shown in table 43 illustrates that the female low creative experimental level is significantly different from the control group in terms of perception of self as a creative person. The difference is significant at the .01 level. No differences were observed for both the high and middle groups.

TABLE 44

Differences between experimental and control male high, middle and low levels on the - Student Creative Rating Scale.

Experimental Levels	N	Control Levels	N	U	P
High	12	High	10	28.50	.05
Middle	7	Middle	6	20.50	n.s.
Low	12	Low	13	27.50	.01

Both the high and low level male experimental groups show significant differences between the control groups on their self perception and reporting of creativity. The differences are significant at the .01 level for the lower level and .05 for the higher level. No differences were obtained for the middle level group. Table 44 presents this data.

TABLE 45

Differences between experimental and control female high, middle and low levels on the - Student Creative Rating Scale "Creative" item.

Experimental Levels	N	Control Levels	N	U	P
High	21	High	29	.12	n.s.
Middle	23	Middle	33	2.15	.05
Low	16	Low	35	1.69	.09

The female middle creative level is significantly different in its self rating of creativity when compared to the middle control group. The difference is significant at the .05 level. No differences were observed for the high and low levels. Table 45 presents this data.

TABLE 46

Differences between experimental and control male high,middle and low levels on the - Student Creative Rating Scale, "Creative" Item.

Experimental Levels	N	Control Levels	N	U	P
High	12	High	10	34.50	n.s.
Middle	7	Middle	6	19.50	n.s.
Low	12	Low	13	53.50	n.s.

For the males no statistically significant differences were obtained by comparing all three levels of creativity on the rating of self on "creative" Table 46 presents this data.

TABLE 47

Differences between experimental and control female high, middle and low levels on the Barron-Welsh Art Scale.

Experimental Levels	N	Control Levels	N	U	P
High	21	High	29	1.69	.09
Middle	23	Middle	33	.71	n.s.
Low	16	Low	35	1.34	n.s.

Table 47 presents an analysis of data for female high, middle and low creative levels on the Barron-Welsh Art Scale. No statistically significant differences were observed.

TABLE 48

Differences between experimental and control male, on high, middle and low levels on the Barron-Welsh Art Scale.

Experimental Levels	N	Control Levels	N	U	P
High	12	High	10	53.50	n.s.
Middle	7	Middle	6	20.00	n.s.
Low	12	Low	13	61.50	n.s.

No statistically significant differences were obtained when comparing the three levels of creativity of the male experimental group with the control group on the Barron-Welsh Art Scale. Table 48 presents this data.

TABLE 49

Statistically significant differences between high, middle and low level experimental and control groups at the .05 level or beyond.

VARIABLES	FEMALES			MALES		
	HIGH	MIDDLE	LOW	HIGH	MIDDLE	LOW
Things Done On Your Own Checklist	X					
SCCICA Places Visited		X	X		X	
SCCICA Performances Attended	X			X	X	X
SCCICA Activities	X		X			X
SCCICA Total Score	X		X	X	X	X
Category Test	X				X	
Plot Test			X			
Apparatus Test						X
Creative Rating Scale			X	X		X
Creative Item		X				
Barron-Welsh Art Scale						

Table 49 presents the statistically significant differences when comparisons are made between experimental and control groups using three levels of creativity.

CHAPTER VI

Summary and Conclusions

The purpose of this study was to evaluate the effectiveness of the Living Arts Program goals of developing various dimensions of creative behavior in adolescents. The study was conducted by selecting an experimental and a control group of 7, 8, 9 and 10 grade students into three levels, high, middle, and low creative on the basis of scores on the Things Done On Your Own Checklist and matched for sex, grade and school attended. Both experimental and control groups took the following pre-tests during October 1967 and January 1968. Student Checklist of Creative Involvement With Community Activities (SCCICA, which yields four different scores. places visited, performances attended, participation in activities, and total score. Three tests of creative thinking were also given: Things Categories Test, a measure of ideational fluency, Plot Titles, a measure of originality and the Apparatus Test, a measure of sensitivity to problems. During December 1968 and January 1969, the Student Checklist of Creative Involvement in Community Activities and the Things Done On Your Own Checklist was administered along with alternate forms of the creative thinking tests were given as post-tests. Also administered at this time was the Student Creative Rating Scale, a 22 item bi-polar scale that ask students to rate themselves on personal characteristics related to creative behavior, and the Barron-Welsh Art Scale, a measure of aesthetic appreciation.

Statistical analysis were completed comparing experimental and control group "difference" scores derived by subtracting pre from post-test scores of the four different scales of the SCCICA and the three creative thinking tests.

Creative Personality, the "creative" item and the Barron-Welsh Art Scale scores were used to compare experimental and control groups.

Results

The results show that the female experimental group significantly increased its creative behavior when compared to the female control group based on the Things Done On Your Own Checklist. We can infer that educational, cultural and creative experiences in the Living Arts Program served as stimuli for the girls to engage in significantly more independent creative activities. No statistically significant increase was obtained when analyzing the data for the males.

Both male and female experimental groups showed significant increases over the control groups in the number of places visited in the community, the number of performances attended, the number of activities and the total number of community activities of a creative nature. From this data it can be inferred that participation in the Living Arts Program had a direct effect in encouraging the experimental group to become significantly more active in the cultural activities of the larger community.

Both male and female experimental groups significantly increased in their creative thinking shells, but for different aspect of creative thinking. The female experimental group increased significantly in ideational fluency, but not the males. No significant increases in originality were found for either males or females. But males did show an increase in their sensitivity of problems.

Students participating in the Living Arts Center perceive and reported themselves as having a more of creative personality than did the control group. This is finding time for both male and female experimental groups. Both male and female experimental groups also rate themselves more "creative" than did both control groups.

Only the female experimental group earned higher scores of aesthetic sensitivity as determined by the Barron-Welsh Art Scale.

Analysis of the differences between the levels, high experimental and high control, middle experimental and middle control, and low experimental and low control was conducted by using the Mann-Whitney U Test, a nonparametric test that tests for significant differences between two groups.

Table 49 presents a summary of the differences significant at the .05 level or beyond. For the female experimental group the high level creative girls were found to have significantly higher scores on five of the eleven variables. The middle group was significantly different from the control group on two variables and the low level on five variables.

For the male groups, the high level males were significantly different on three variables; the middle level four variables, and the low level five variables.

Discussion

The findings of this research support and substantiate the evidence cited by Torrance, (17, 18) Brown, (1) and Wallach & Kogan (19) that deliberate efforts to improve certain dimensions of creative behavior are successful. Studies by Gallagher indicate that divergent production in a classroom is dependent on the kinds of thought-processes required by the teacher. When convergent and cognitive-memory skills are stressed by the teacher, students respond with behavior characteristics as simple awareness or engage in memory functions. When teachers require divergent thinking skills, students respond with original and unique behavior.

Students participating in the Center program learned from teachers who could use open-ended methods of instruction that provided students with an opportunity to become more completely involved. Self initiated learning which lead to satisfying personal goals was a dominate teaching method in the program.

By experiencing the many and varied activities of the Center, the experimental groups, both male and female, perceive themselves as more creative persons than the control group. Specifically they see themselves as more expressive, enthusiastic, imaginative, aesthetic, ingenuous, and confident than the control group.

The self reports of the experimental group show increases in creative characteristics that are found to be characteristic of creative adults. Guilford (4) has found that creative persons tend to be interested in aesthetic expression, reflective thinking, and are more tolerant of ambiguity. Taylor (13) found creative persons to be more curious, autonomus, and persistent in intellectual matters; more independent in judgement and more open to understanding all facets of their inner selves.

Torrance (16) believes that the creative child posses a need to know himself and his environment and to seek out new experiences. He has a need to exhibit originality, imagination, courageous and non-conforming behavior. Further Torrance (17) suggests that developing skills of inquiry, learning through satisfying a child's natural curosity, and a relationship with a teacher that is characterized by trust and respect for the dignity and worth of the individual are essential for development of creative abilities.

An important aspect of creativity is the quality of aesthetic sensitivity. The female experimental group showed a significant mean difference when compared to the control group on the Barron-Welsh Art Scale which has demonstrated that higher scores are related to independence of judgement, originality, and breadth of interest.

The results of this study indicate that the experimental groups have made significant increases in certain areas of creativity when compared to the control group. Probably the most important findings are that both males and females in the Living Arts Program have become more involved in cultural activities of the community; perceive and report themselves as having greater imagination, curosity and ingenuous personal qualities; and developed creative thinking abilities that show girls as more fluent in ideas and males more sensitive to problems.

Appendix A

TABLE 50

Statistics based on "difference" score for the male experimental and control groups.

Description	Experimental				Control			
		N	M	SD		N	M	SD
1. Things Done on Your Own Checklist	H	12	3.83	20.13	H	10	-1.60	19.77
	M	7	15.43	9.32	M	6	4.33	14.99
	L	12	25.08	18.06	L	13	22.62	12.49
2. SCCICA Places Visited	H	12	2.58	1.98	H	10	2.40	3.13
	M	7	2.43	1.81	M	6	-1.33	2.25
	L	12	2.33	2.35	L	13	0.46	2.47
3. SCCICA Performances Attended	H	12	5.00	3.69	H	10	-0.60	6.69
	M	7	4.29	4.92	M	6	-2.17	3.82
	L	12	3.75	4.39	L	13	-1.77	5.39
4. SCCICA Activities Participated	H	12	3.33	3.11	H	10	-0.10	4.56
	M	7	3.29	3.09	M	6	-1.83	5.91
	L	12	2.67	3.60	L	13	-1.92	5.69
5. SCCICA Total	H	12	10.92	7.76	H	10	1.70	10.17
	M	7	10.00	8.98	M	6	-5.33	5.72
	L	12	8.75	8.38	L	13	-3.23	10.85
6. Category Test	H	12	-9.08	4.60	H	10	-5.90	6.95
	M	7	-13.00	3.74	M	6	-8.33	4.32
	L	12	-8.92	3.15	L	13	-9.15	4.93
7. Apparatus Test	H	12	-0.17	4.28	H	10	-0.90	4.33
	M	7	1.86	4.02	M	6	0.00	4.69
	L	12	0.33	4.27	L	13	-4.23	4.60
8. Plot Test	H	12	0.50	1.09	H	10	1.40	3.86
	M	7	1.71	2.29	M	6	1.17	1.72
	L	12	0.83	1.19	L	13	0.92	1.85

TABLE 51

Statistics based on "differences" scores for the female experimental and control groups.

Description	Experimental				Control			
		N	M	SD		N	M	SD
1. Things Done On Your Own Check-list	H	21	9.81	12.15	H	29	.17	13.20
	M	23	10.96	15.61	M	33	12.88	13.04
	L	16	23.69	14.29	L	35	15.80	11.60
2. SCCICA Places Visited	H	21	0.48	2.66	H	29	0.76	1.86
	M	23	2.26	2.34	M	33	0.97	2.14
	L	16	3.25	3.00	L	35	0.71	2.76
3. SCCICA Performances Attended	H	21	2.76	2.90	H	29	0.62	3.57
	M	23	1.39	2.68	M	33	0.97	2.95
	L	16	2.81	3.83	L	35	0.89	3.50
4. SCCICA Activities Participated	H	21	1.67	2.56	H	29	-0.97	3.25
	M	23	0.56	3.20	M	33	-0.67	3.08
	L	16	2.62	4.03	L	35	-0.54	3.48
5. SCCICA Total	H	21	6.48	5.39	H	29	0.41	6.18
	M	23	4.22	5.87	M	33	1.27	5.95
	L	16	8.69	7.37	L	35	1.00	7.69
6. Category Test	H	21	-10.62	4.48	H	29	-7.52	3.73
	M	23	-9.17	4.27	M	33	-8.46	3.53
	L	16	-7.12	4.53	L	35	-7.00	3.83
7. Apparatus Test	H	21	-1.57	3.94	H	29	0.07	4.33
	M	23	-0.56	4.38	M	33	-1.52	4.54
	L	16	0.19	4.61	L	35	-0.66	4.66
8. Plot Test	H	21	1.71	1.31	H	29	1.45	1.68
	M	23	1.70	2.82	M	33	1.52	1.92
	L	16	0.50	1.63	L	35	1.17	1.67

TABLE 52

Descriptive statistics for the Female Experimental and Control groups Barron-Welsh Art Scale, Student Creative Rating Scale and the Creative Item.

FEMALE		EXPERIMENTAL					CONTROL	
		N	M	SD		N	M	SD
Barron-Welsh Art Scale	H	21	34.67	6.39	H	29	30.97	8.59
	M	23	33.09	9.62	M	33	29.82	12.07
	L	16	34.94	11.31	L	35	30.17	10.55
Student Creative Rating Scale	H	21	111.52	13.81	H	29	106.28	14.92
	M	23	108.30	12.45	M	33	105.94	14.00
	L	16	118.00	7.95	L	35	101.26	15.86
Student Creative Rating Scale Item 22	H	21	5.81	1.03	H	29	5.76	1.09
	M	23	5.96	1.06	M	33	5.21	1.41
	L	16	6.06	.85	L	35	5.46	1.20

TABLE 53

Descriptive statistics for the male experimental and control groups Barron-Welsh Art Scale, student creative rating scale, and creative item.

MALE		EXPERIMENTAL					CONTROL	
		N	M	SD		N	M	SD
Barron-Welsh Art Scale	H	12	24.17	9.19	H	10	24.80	9.39
	M	7	26.86	14.96	M	6	26.33	13.75
	L	12	29.42	9.55	L	13	24.77	14.64
Student Creative Rating Scale	H	12	118.17	10.19	H	10	103.20	16.92
	M	7	107.14	16.49	M	6	103.50	29.58
	L	12	111.25	8.64	L	13	98.31	14.51
Student Creative Rating Scale Item 22	H	12	6.25	.87	H	10	5.20	1.55
	M	7	5.14	1.34	M	6	5.17	1.83
	L	12	6.00	.85	L	13	5.08	1.75

Appendix D

Things Done On Your Own Checklist

Student's Code ______________

STUDENT CHECK LIST

PLEASE PRINT ______________

Student's Name ____ Age ______ Sex ________

School ____ Grade ___________

Student's Home Address __________________________________ Phone ___________

Parent's or Guardian's Name ____

Parent's or Guardian's Address __________________________ Phone ___________

INSTRUCTIONS: Below is a list of activities boys and girls sometimes do on their own. Indicate which ones you have done by checking the blank at the left. Include only the things you have done on your own, not the things you have been assigned or made to do.

( ) 1. Wrote a poem
( ) 2. Wrote a story
( ) 3. Wrote a play
( ) 4. Kept a collection of my writings
( ) 5. Wrote a song or jingle
( ) 6. Produced a puppet show
( ) 7. Kept a diary for at least a month
( ) 8. Played word games with other boys and girls
( ) 9. Used ROGET'S THESAURUS or some other book in addition to a dictionary
( ) 10. Recorded on a tape recorder an oral reading, dialogue, story, discussion, or the like
( ) 11. Found errors in fact or grammar in newspaper or other printed matter
( ) 12. Acted in a play or skit
( ) 13. Directed or organized a play or skit
( ) 14. Made up and sang a song
( ) 15. Made up a musical composition for some instrument
( ) 16. Made up a new game and taught it to someone else
( ) 17. Pantomimed some story
( ) 18. Acted out a story with others
( ) 19. Wrote a letter to a member of family or a friend away from home
( ) 20. Made up an original dance
( ) 21. Played charades
( ) 22. Visited a zoo
( ) 23. Explored a cave
( ) 24. Read a science magazine
( ) 25. Read a science book
( ) 26. Mixed colors
( ) 27. Made a fire cracker
( ) 28. Printed photographs
( ) 29. Grew crystals
( ) 30. Made a leaf collection
( ) 31. Made a wildflower collection
( ) 32. Made an electric motor
( ) 33. Made a musical instrument
( ) 34. Planned an experiment
( ) 35. Dissected an animal
( ) 36. Grafted a plant or rooted one from a cutting
( ) 37. Distilled water
( ) 38. Used a magnifying glass
( ) 39. Made ink
( ) 40. Made leaf prints
( ) 41. Started a fire with a lens
( ) 42. Used a magnet
( ) 43. Raised rats, mice, rabbits, or guinea pigs
( ) 44. Collected insects
( ) 45. Collected rocks
( ) 46. Kept a daily record of weather
( ) 47. Been a bird watcher
( ) 48. Kept a science notebook
( ) 49. Kept a science scrapbook
( ) 50. Attended a science fair or display
( ) 51. Used a chemistry set
( ) 52. Produced static electricity
( ) 53. Constructed a model airplane
( ) 54. Designed a model airplane
( ) 55. Counted annual rings on a log
( ) 56. Made a stamp collection
( ) 57. Made a collection of post marks
( ) 58. Organized or helped to organize a club
( ) 59. Served as officer in a club organized by boys and/or girls

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( ) 60. Figured out a way of improving a game we play at school or home
( ) 61. Figured out a way of improving the way we do something at home
( ) 62. Figured out a way of improving the way we do something at school
( ) 63. Figured out a way of improving the way we do something in a club, Scouts, etc.
( ) 64. Solved a problem about getting along with my parents
( ) 65. Solved a problem about getting along with other boys and girls
( ) 66. Helped act out some historical event
( ) 67. Found out about the history of my city or community
( ) 68. Found out about the way some government agency (post office, court, etc.) operates
( ) 69. Wrote a letter to someone in another country
( ) 70. Wrote a letter to someone in another state
( ) 71. Made a map of my community
( ) 72. Made my own decision about the use of money
( ) 73. Asked questions about the way some business operates
( ) 74. Made a poster for some club, school or other event
( ) 75. Organized or helped organize paper drive, rummage sale, etc.
( ) 76. Sketched a landscape with pencil and/or charcoal
( ) 77. Designed stage settings for a play or skit
( ) 78. Developed a design for jewelry
( ) 79. Developed a design for cloth
( ) 80. Illustrated a story of my own or one in a book
( ) 81. Took color photographs
( ) 82. Took black and white photographs
( ) 83. Made an illustrated map of a local community
( ) 84. Made plaster molds with which clay objects can be cast
( ) 85. Drew cartoons
( ) 86. Designed greeting card for some holiday or event
( ) 87. Made linoleum cuts
( ) 88. Made block prints in color
( ) 89. Made a watercolor painting of a familiar scene
( ) 90. Made an oilcolor painting of some type
( ) 91. Made animal figures in the paper sculpture technique or paper mache
( ) 92. Made a toy for a child
( ) 93. Built a scale model of a park, playground, farm, etc.
( ) 94. Made a wood carving
( ) 95. Made a soap carving
( ) 96. Made a basket for ornamental purpose
( ) 97. Drew up plans for an invention, apparatus, etc.
( ) 98. Constructed a mold for an invention, apparatus, etc.
( ) 99. Made up recipe for some kind of food dish (meat, salad, dessert, etc

The work presented or reported herein was performed pursuant to a Grant from the U.S. Office of Education, Department of Health, Education, and Welfare.

TITLE III ESEA

LIVING ARTS PROGRAM

Appendix E

Student Rating Scale

Date __________ Student's Code ______________

STUDENT RATING SCALE

PLEASE PRINT Student's Score ______________

Student's Name ______________________________ Age ______ Sex ______

School ______________________________ Grade ______________

Student's Home Address ______________________________ Phone ______________

Parent's or Guardian's Name ______________________________

Parent's or Guardian's Address ______________________________ Phone ______________

Rater's Name & Teaching Field ______________________________

INSTRUCTIONS: Please rate the student on the following seven point rating scale. The two sides of the scales represent opposite ends of a continuum. Circle the number that best describes the student in terms of each scale. Do not be afraid to use the extreme ends of the scales in your ratings. Seven is the highest rating a student can receive, one is the lowest.

1.	Mentally Active many ideas, much class participation, self-starter	7	6	5	4	3	2	1	Mentally Passive few ideas, very limited class participation, not a self-starter
2.	Afraid to Risk Self over-cautious, fearful, timorous	1	2	3	4	5	6	7	Unafraid to Risk Self dauntless, daring
3.	Unresponsive dull, phlegmatic, lethargic	1	2	3	4	5	6	7	Responsive keen, alert, aware, outgoing
4.	Distinctive unique, individual	7	6	5	4	3	2	1	Mediocre ordinary, run of the mill
5.	Restrained non-expressive, unable to communicate	1	2	3	4	5	6	7	Expressive communicative, talkative
6.	Apathetic indifference, lackadaisical	1	2	3	4	5	6	7	Enthusiastic spirited, zealous
7.	Imaginative original, ability to discover, envision, inventive	7	6	5	4	3	2	1	Unimaginative commonplace, not original, not inventive
8.	Curious questioning, inquisitive	7	6	5	4	3	2	1	Unquestioning indifferent, uninterested
9.	Unresourceful inability to find uses for whatever is available in one's own environment	1	2	3	4	5	6	7	Resourceful ability to find uses for whatever is available in one's own environment
10.	Sensitive to Ideas perceptive, tolerant willing to suspend judgment	7	6	5	4	3	2	1	Insensitive to Ideas not perceptive, intolerant, narrow-minded

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11.	Utilitarian pragmatic, does his work, practical	1	2	3	4	5	6	7	Aesthetic artistic, more emphasis on feeling than thinking
12.	Gives Up Easily no stick-to-itiveness, quitter	1	2	3	4	5	6	7	Perserverance determination, drive, dedication or devotion to a task
13.	Independence of Judgement questioning, challenging, dissents, makes up his own mind	7	6	5	4	3	2	1	Conforms accepts authority without question, gives in
14.	Flexible adventurous, versatile, ability to reject or accept judgment	7	6	5	4	3	2	1	Rigid not flexible, exact
15.	Unconventional non-conformity, wild ideas, unbrideled	1	2	3	4	5	6	7	Conventional conforms, follows rules and instructions
16.	Productive produces, accomplishes, gets things done	7	6	5	4	3	2	1	Ineffective non-productive, disorganized doesn't do much
17.	Ingenious clever, inventive, shrewd	7	6	5	4	3	2	1	Floundering inept, muddles along, plodder
18.	Unsure insecure, doubting, vacillating	1	2	3	4	5	6	7	Confident self-assured, self-reliant secure
19.	Realistic Goals purposeful activity, goal oriented	7	6	5	4	3	2	1	Wishful Thinking day dreaming, nebulous, meandering
20.	Humorous sense of humor	7	6	5	4	3	2	1	Prosaic no sense of humor
21.	Well adjusted, conforms to behavioral norms of his group, willing to accept judgment of authorities, obedient, courteous, prompt in doing work, neat and orderly, reserved, popular, well liked by peers	1	2	3	4	5	6	7	Courageous in conviction, independent in thinking and judgment, absorbed and preoccupied with tasks, intuitive, persistent, unwilling to accept things on say-so, willing to take risks, not willing to accept judgments of authorities
22.	Creative	7	6	5	4	3	2	1	Non-Creative

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TITLE III ESEA

LIVING ARTS PROGRAM

Appendices F, G, J, and K have been deleted due to copyrighted material for which no release could be obtained.

APPENDIX F:

"Apparatus Test--Sep-1, Form A"
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APPENDIX G:

"Apparatus Test--Sep-1, Form B"
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APPENDICES J AND K:

"Plot Titles--0-1, 0-2"
J. P. Guilford, University of
Southern California.

Appendix H

Thing Categories Test Form A

Name: ____________________________________

THING CATEGORIES TEST - Fi-3

Form A

This is a test to see how many things you can think of that are alike in some way.

Below are two examples of things that are always red or that are red more often than any other color. Look at these examples. Then go ahead and write in the blanks more things that are always red or that are red more often than any other color. You may use one word or several words to describe each thing.

tomatoes
bricks
____
____
____
____
____
____
____
____

Your score will be the number of correct things that you write.

You will have 3 minutes for each of the two parts of this test. When you have finished Part 1, STOP. Please do not go on to Part 2 until you are asked to do so.

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Form A (3 minutes)

The category is "round".

Go ahead and write all the things that are round or that are round more often than any other shape.

DO NOT GO ON TO THE NEXT PAGE UNTIL ASKED TO DO SO.

STOP.

Appendix I

Thing Categories Test Form B

Name: ____

THING CATEGORIES TEST - Fi-3

Form B

This is a test to see how many things you can think of that are alike in some way.

Below are two examples of things that are always red or that are red more often than any other color. Look at these examples. Then go ahead and write in the blanks more things that are always red or that are red more often than any other color. You may use one word or several words to describe each thing.

tomatoes

bricks

____

____

____

____

____

____

____

____

Your score will be the number of correct things that you write.

You will have 3 minutes for each of the two parts of this test. When you have finished Part 1, STOP. Please do not go on to Part 2 until you are asked to do so.

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Form B (3 minutes)

The new category is "blue".

Go ahead and write all things that are always blue or that are blue more often than any other color.

DO NOT GO BACK TO PART 1 AND
DO NOT GO ON TO ANY OTHER TEST UNTIL ASKED TO DO SO.

STOP.

Appendix L

Student Checklist of Creative Involvement With Community Activities

STUDENT SURVEY

Name ______________________________ Age ______________

Grade ____________ School ______________________________

Have you visited any of these places?

		Yes	No
1.	The Dayton Art Institute	____	____
2.	Public Library	____	____
3.	Museum of Natural History	____	____
4.	Air Force Museum (WPAFB)	____	____
5.	Wright Brothers Memorial	____	____
6.	A television studio	____	____
7.	A radio station	____	____
8.	Paul Lawrence Dunbar House	____	____
9.	Carillon Park	____	____
10.	Aullwood Audubon Center	____	____
11.	Aullwood Children's Center	____	____
12.	National Cash Register Company	____	____
13.	McCall Corporation	____	____
14.	Merchandise Display	____	____
15.	Glen Helen	____	____
16.	Art Gallery	____	____
17.	Fair (a county or state fair)	____	____
18.	Airport	____	____
19.	Dog Cemetery	____	____
20.	College or university	____	____

Have you attended any of these performances?

1.	Dayton Philharmonic Orchestra	____	____
2.	Junior Philharmonic Training Orchestra	____	____
3.	Children's Concerts - Memorial Hall	____	____
4.	Dayton Opera Association	____	____
5.	Dayton Community Theater	____	____
6.	Trotwood Circle Theater	____	____
7.	K-O Theater	____	____
8.	Dayton Community Children's Theater	____	____
9.	All-City Orchestra	____	____
10.	All-City Band	____	____
11.	NCR Band	____	____
12.	Summer Municipal Band	____	____
13.	Montgomery County Recreation Band	____	____
14.	Daytona Chorale	____	____
15.	Dayton Civic Ballet	____	____
16.	A dance school recital	____	____
17.	Antioch Amphitheatre	____	____
18.	Rotary Boys' Choir	____	____
19.	Cameo Series	____	____
20.	Vanguard Series	____	____
21.	Kenley Players	____	____
22.	Dayton Art Institute Tour	____	____
23.	High School Arts Program	____	____
24.	Elementary School Arts Program	____	____
25.	City Recreation Show Wagon	____	____
26.	County Recreation Show Wagon	____	____

		Yes	No
27.	Other ____________	____	____
28.	____________	____	____
29.	____________	____	____
30.	____________	____	____

Have you participated in any of these activities?

1.	Dayton Philharmonic Orchestra	____	____
2.	Junior Philharmonic Training Orchestra	____	____
3.	All-City Orchestra	____	____
4.	All-City Band	____	____
5.	Montgomery County Band	____	____
6.	NCR Band	____	____
7.	School Band	____	____
8.	School Orchestra	____	____
9.	School Choir	____	____
10.	Rotary Boys' Choir	____	____
11.	Church junior, youth, or senior choir	____	____
12.	Dayton Children's Theater	____	____
13.	Dramatic presentation	____	____
14.	Dayton Civic Ballet	____	____
15.	Dance school recital	____	____
16.	Instrumental music recital	____	____
17.	Television "Rising Generation"	____	____
18.	Vocal music recital	____	____
19.	Art exhibit	____	____
20.	School of the Dayton Art Institute	____	____
21.	Combo	____	____
22.	Organized and presented a play	____	____
23.	Worked on a newspaper (church, school, etc.)	____	____
24.	Talked with an artist, writer, musician, actor, or dancer	____	____
25.	Jazz or folk singing group	____	____
26.	Salvation Army Band	____	____
27.	Produced a puppet show	____	____
28.	Speech contest	____	____
29.	Spelling bee	____	____
30.	Storytelling	____	____
31.	Other ____________	____	____
32.	____________	____	____
33.	____________	____	____
34.	____________	____	____
35.	____________	____	____

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Appendix M

Barron-Welsh Art Scale

Appendix N

Results of the Reliability Study for the Student Creative Rating Scale

Results of the Reliability Study for the Student Creative Rating Scale

The Spearman-Brown prophecy formula was used to estimate the reliability of the Student Creative Rating Scale of both experimental and control groups.

EXPERIMENTAL GROUP N=92.

$$r_{11} = \frac{2 \times (.73)}{1 + .73} = .84$$

Estimated reliability .84.

CONTROL GROUP N=126.

$$r_{11} = \frac{2 \times (.81)}{1 + .81} = .89$$

Estimated reliability .89.

The Spearman-Brown formula indicates that the Student Creative Rating Scale yields adequate reliability estimates for this kind of Rating Scale.

BIBLIOGRAPHY

1. Brown, G. I. "A Second Study in the Teaching of Creativity." Harvard Educational Review, 1965, 35, 39-54.

2. Getzels, J. W., & Jackson, P. W. Creativity and Intelligence. New York, Wiley, 1962.

3. Guilford, J. P. "Creativity" American Psychologist, 1950. 9, 444-454.

4. Guilford, J. P. "Creative Abilities in the Arts." Psychological Review, 1957, 64, 110-118.

5. Guilford, J. P. "Can Creativity Be Developed?" Art Education, Vol. 11, 3-18.

6. Klausmeier, H. J., & Goodwin, W. Learning and Human Abilities. New York: Harper & Row, 1966.

7. Kneller, G. F. The Art and Science of Creativity, New York: Holt, Rinehart & Winston, 1965.

8. MacKinnon, Donald "Developing Creativity". Journal of Secondary Education, 1963, 38, 1966-174.

9. MacKinnon, Donald, "The Nature and Nurture of Creative Talent". American Psychologist, 1962, 17, 484-405.

10. Massialas, B. G., & Zevin, J. Creative Encounters in the Classroom. New York: John Wiley & Sons, 1967.

11. Maltzman, I. "On the Training of Creativity." Psychological Review. 1960, 67, 229-242.

12. Meyers, R. E. and Torrance, E. P., Can Teachers Encourage Creative Thinking? Educational Leadership, 1961, 19, 156-159.

13. Parnes, S. J., & Meadow, A. "Evaluation of Persistence of Effects Produced by a Creative Problem Solving Course". Psychological Reports, 1960, 7, 357-361.

14. Taylor, C. W. ed. Creativity: Progress and Potential. New York: McGraw-Hill, 1964.

15. Torrance, E. P. "Creativity". What Research Says to the Teacher, Number 28, National Educational Association, 1963.

16. Torrance, E. P. Gifted Children in the Classroom. New York: McMillian Co., 1965.

17. Torrance, E. P. Guiding Creative Talent. Englewood Cliffs, N. J., Prentice-Hall, 1962.

18. Torrance, E. P. "Priming Creative Thinking in the Primary Grades." Elementary School Journal., 62, 34-41.

19. Wallach, M. A., & Kogan, N. Modes of Thinking in Young Children. New York: Holt, Rinehart, & Winston 1965.

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